UPDATED Executive Summary
Easygrant 7356
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The State of Connecticut Department of Information Technology is providing leadership to, and partnering with, Connecticut state agencies and initiatives, including the Department of Public Safety, the Connecticut Education Network, which includes Connecticut's Public Libraries and Charter Schools, and Connecticut Public Broadcasting, Inc. (CPBI) to enhance broadband access to the residents of the state of Connecticut. This proposal seeks funding to serve all of Connecticut's 3.4 million residents, while providing necessary infrastructure to underserved communities. This proposal will:

(1) Deploy Middle Mile broadband infrastructure with a commitment to offer new or substantially upgraded service to Public Libraries, critical **community anchor institutions.** Those community anchor institutions have expressed a demand for improved access to broadband service;

(2) Deploy Middle Mile broadband infrastructure and incorporate a public-private partnership among government, **non-profit** and for profit entities, including Connecticut Public Television and non-profit community-based "charter schools" who have expressed a demand for access to broadband service;

(3) Deploy Middle Mile broadband infrastructure with the intent to bolster growth in economically distressed areas utilizing community anchor institutions to provide direct access to those living in rural areas where access is otherwise prohibitively expensive;

(4) Deploy Middle Mile broadband infrastructure with a commitment to **serve community colleges** that have expressed a demand for improved access to broadband service;

(5) Deploy Middle Mile broadband infrastructure with a commitment to serve **public safety entities** that have expressed a demand for improved access to broadband service;

(6) Deploy Middle Mile broadband infrastructure that includes (i) a Last Mile infrastructure component for critical Public Safety and First Responder entities, as well as community anchor institutions.

(7) Contribute a non-Federal cost match that equals or exceeds 20 percent of the total eligible costs of the project.

Among the specific benefits of the application are:
- ✓ The preservation and creation of jobs and investment in infrastructure that will provide long-term economic benefits
- ✓ Spurring technological advances in education, health and public safety
- ✓ Stabilizing state and local government budgets by leveraging coordinated management and procurement efforts
- ✓ Providing improved access to broadband service to consumers who are underserved because of economic or geographic conditions
- ✓ Providing broadband access, education, awareness, training, equipment, and support to community anchor institutions, to include improved access by public safety agencies
- ✓ Expanding current data networks in existing areas and creating capacity to allow for the immediate provision of services by third party providers in areas currently underserved
- ✓ Stimulating demand and enabling access for broadband and, economic growth and job creation
- ✓ Enhancing the reliability of existing broadband infrastructure

✓ Enabling the expanded network to connect with neighboring states to support future interstate collaboration

In all, the project will provide broadband access to a significant number of community anchor institutions, including 667 points of education and public safety while laying the foundation for potential future access at all the State's households, although public subscribers are not directly applicable to this application. The overall cost for this effort is $117,318,786, creating 1,271 jobs as a result.

Key Participants
Connecticut Department of Information Technology (DOIT)
The mission of the Department of Information Technology is to provide quality information technology (IT) services and solutions to customers, effectively aligning business and technology objectives through collaboration, in order to provide the most cost-effective solutions that facilitate and improve the conduct of business for our state residents, businesses, visitors and government entities.

Connecticut Department of Public Safety (DPS)
The Connecticut Department of Public Safety is committed to protecting and improving the quality of life for all by providing enforcement, regulatory and scientific services through prevention, education and innovative use of technology.

Connecticut Education Network (CEN)
The Connecticut Education Network (CEN) connects the state's public K-12 school districts, a number of Charter Schools, community Colleges, four-year colleges and universities, and many public libraries via a fiber optic backbone dedicated for education, research and public computing center use. CEN provides access to the Internet, Internet2, iCONN - Connecticut's re-search engine, programming from Connecticut Public Television, and other resources targeted to students, teachers, researchers, administrators and library patrons in Connecticut.

Under the aegis of CEN, critical partners in the delivery of broadband functionality to the community are Connecticut's Community Colleges, Connecticut's Public Libraries and Connecticut Public Television (CPTV).

The Projects
Connecticut Public Safety Services Data Network (CPSSDN)

Points of Int.	547
No. of Counties	8
Hsehld.	1,293,079
Poten. Jobs Created	867
Total Cost	$79,932,969

In 2005, the Connecticut General Assembly passed and Governor Rell signed into law Public Act 05-181 which enabled the Office of Statewide Emergency Telecommunications (OSET) to initiate a planning process for the investigation and requirements determination of an integrated safety data network. Surveys of current systems and needs led to the initiation of a feasibility study in 2006. The study included recommendations for network infrastructure solutions that would establish a new, integrated public safety data network, saving affected agencies substantial sustainable costs.

Additionally, the study noted that the stand-alone legacy network infrastructure systems that Connecticut public safety agencies utilize minimally met the bandwidth requirements for current use and were grossly inadequate for near or long term projected future data transmission requirements. Also, the data network utilized by the Enhanced 911 system did not have the necessary universal data connectivity to provide for next generation 911 functionality. Finally, numerous public safety first responders and providers including police departments, fire departments, emergency management/homeland security and others did not have any data connectivity to receive or transmit critical data for emergency services as well as PSAP disaster recovery and business continuity needed to be improved.

Due to funding considerations, the project is divided into two phases. Phase 1 will establish the base fiber optic network topology inter-connecting the existing 108 PSAPs,3 Department of Public Safety administrative buildings and the DOIT data center. To that end, Phase 1 of the CPSSDN project is planned to be initiated in FY2010 and would be completed in FY2011. Phase 1 utilizes a fiber footprint that includes approximately 2000 miles of on-net fiber installation as well as approximately 240 miles of newly provided (or off-net) fiber segments in a 6 interconnecting ring topology with DWDM technologies delivering 10 gigabit per second ethernet services to all connected locations. Additionally, a separate 10 gigabit per second DWDM lambda segment will provide core ring interconnectivity.

Phase 2 of the CPSSDN, seeks to implement additional coverage and capacity of the CPSSDN, expanding coverage to an additional 435 public safety related locations so as to realize the necessary connectivity requirements and anticipated efficiency improvements. As with Phase 1, all connectivity will be accomplished via dedicated fiber optic cabling to the planned locations utilizing appropriate fiber optic transceivers and delivering 1 gigabit per second Ethernet services. Topology will be a mixture of both hub and spoke as well as subtending rings. Each of these spokes or rings will connect to one of the 112 Phase 1 locations. Completion of Phase 2 will greatly enhance agency interoperability capabilities, data sharing and overall communications while improving constituent services and safety.

Funding resources originally designated to begin implementation of the CPSSDN project will be utilized for the non-Federal cost match contribution requirement for this BTOP submission.

Connecticut Education Network (CEN)

Points of Int.	120
No. of Counties	8
Hsehld.	318,876
Poten. Jobs Created	401
Total Cost	$37,071,921

The purpose of the CEN project is to provide improved access to broadband Internet connectivity, including network equipment and user support, to Connecticut's K-12 school districts, colleges and universities, and public libraries. These proposed sites do not directly connect to the existing CEN fiber backbone and face two major limitations: limited bandwidth capacity and lack of fiber redundancy.

This project aims to deliver 100 megabits per second service to the community anchor institutions in Connecticut that currently lack this level of connectivity as well the redundancy necessary to ensure

uninterrupted broadband access, including Connecticut's K-12 school districts, colleges and universities, public libraries and public computing centers. In addition, a partnership with Connecticut Public Television will provide significant advantages of lowering operating costs and providing higher, more stable bandwidth than is currently available to provide health, education and other information to a wide audience, including the very young and aged. The project would extend 675 miles of new fiber optics, install the necessary hardware to support the 100 Mbps service, including three new hub routers and offer user support to all Connecticut Education Network members via the Connecticut State Department of Information Technology's Help Desk and 24/7 Network Operations Center.

Charter Schools

Charter schools are authorized by the State Board of Education. Local charter schools are funded by local or regional boards of education; state charter schools are funded by the state. They provide small-scale educational programs managed by a governing board comprised of teachers and parents or guardians of the students enrolled in the school and may include community members. Charter schools offer a range of educational programs, small class size, and enhanced teacher-parent communication. In many cases, they are providing an enriched curriculum to students who would otherwise be enrolled in inner-city schools where overall student performance has been below the State average. In other cases, they provide additional curriculum items not available in the public environment. In all cases, their interest in receiving as much bandwidth as possible has motivated them to join CEN. The current additions to CEN will be receiving more bandwidth at a lower cost than was available to them without the services to be provided under this application.

Community Colleges

This application will expand access to information and instructional technology for and additional two Community Colleges, Quinebaug Valley in Danielson and Northwestern Connecticut, in Winsted, furthering the State's goal of providing quality higher education and workforce training through educational delivery systems and state-of-the-art instructional technology to meet the needs of students.

The Connecticut Community Colleges serve over 50 per cent of the state's public college undergraduates with over 55,000 credit students enrolled each semester and over 35,000 non-credit students enrolled throughout the year. Since 2000, headcount enrollment has grown by 35 percent and full-time students, usually younger more traditional students, have increased by 97 per cent in the same time period. In order for these students to gain the knowledge needed to advance to higher levels of education and to enter the workforce with the skills required by Connecticut's competitive job market, they must have access to the most advanced educational technology and the latest information available. The inclusion of two more colleges in the system in this ARRA Broadband Grant means that all community college facilities will be capable of supporting the kind of education that internet-savvy younger students require. In addition, with fifty percent of the non-credit enrollments focused on workforce development, students who are training or retraining for a career will have the resources necessary to support their efforts.

These two facilities are in remote, more sparsely populated areas of the State with a higher cost for connection that has made CEN fiber backbone access unavailable within CEN funding. Connecting these last two colleges will be a major improvement in the educational environment for the students in these two locations and will result in major improvements to the internet environment in this part of the State.

Public Libraries

As part of this application, CEN plans to add 15 public libraries to the current network. Connecticut's public libraries are at the forefront of providing public access to the Internet in every community. When the National Information Infrastructure (NII) was first being discussed in 1991 our public libraries were there. Today, access to the Internet is essential for any public library to carry out its mission. Libraries play a vital role in supporting life-long learning, career development, small business creation and access to e-government through their free public access terminals and professional assistance. Public libraries serve, without charge, all segments of society including those who are less-educated, those with lower-incomes, minorities, older adults, and the unemployed. Broadband connections are one of the critical elements that allow libraries to provide these essential services to the public. No longer will static pages meet the information needs of today's library user. Web 2.0 applications provide much richer information and online experiences. But the ever expanding array of multimedia resources delivered through the Internet demand more and faster broadband access. Unfortunately, not every library has access to the same level of connectivity. Lack of line speed limits a library's ability to meet the growing demand for computer and Internet resources. Increased access to broadband will enable public libraries to offer increased assistance and resources to the communities they serve. Fiber optic cable will be the best long-term solution for high-speed broadband deployment for libraries.

Community Access to the Internet Through Connecticut's Public Libraries

Connecticut's public libraries serve a central role in providing free access to computers and the Internet. Many people still lack high-speed Internet access in their home. Only about half of households with a family income less than $35,000 have home Internet access. Only 23% have access to broadband connectivity. For those with limited access to online services, the public library is an important bridge to increasingly essential tools. Many libraries report they are the only source of free Internet access in their community. To meet the growing demands for use, libraries continue to increase the number of public access computers. This puts further strains on their bandwidth. Demand already is high for fast connections and public access workstations, and likely will increase in the future. Library usage is up, as patrons cut costs by borrowing materials and using online resources at the library.

Visits to public libraries grow every year and now top 1.4 billion nationally, 23.2 million in Connecticut.

On average, 15,000 people use public library internet stations every day in Connecticut.

Learning Through Connecticut's Public Libraries

The public library is a key agency in support of the educational and learning needs of every person in the community. They are a vital resource for helping young children learn to read, for providing homework help for all levels of school, for a wealth of resources for homeschooling families, for students taking online courses for college credit and for adult learners continuing their education. In fact, competitiveness in the 21st century demands that people continue their learning when they leave the classroom. Staying relevant in a rapidly changing workforce will require familiarity and facility with technology, as well as increased skills in successfully navigating information online. The public library is a vital community resource that brings together trained information professionals, technology access and high quality content to meet the needs of patrons in the digital.

All public libraries in Connecticut offer online educational resources through iCONN (www.iconn.org) and locally funded databases. iCONN ensures universal access to a core level of library and information resources for every resident of Connecticut through their public library,

school, college, and from home; helps provide an equitable level of necessary information resources to every school in Connecticut so that all students are prepared to function in an information society, provides information resources to the increasing number of students taking advantage of on-line courses at Connecticut's colleges and universities; and supports the information needs of all Connecticut citizens.

Students, from elementary school through college, use the public library to complete homework assignments.

More than three-quarters of parents of homeschooled students use the public library to support their children's educations.

American adults report the most common purpose for using public library computers is to meet educational needs.

According to the Public Library Funding & Technology Access Study, the vast majority of public libraries (78.7%) report that providing education resources and databases for K-12 students is the Internet-based service most critical to the role of the library.

Students without high-speed Internet access are at a distinct disadvantage. Ninety-six percent of school districts polled by the National School Boards Association have at least some teachers who assign homework to students that requires the Internet to complete. Thirty-five percent of school districts report that more than half their teachers assign homework that requires the Internet. About half of all teens have gone online from a library, and more than one-third of teen-agers who visited the public library in the last year said they went to the library to use the library Web site for information and research.

…contrary to what many believe, all students don't have home computers with Internet connections. Some students who have Internet connections only have dial-up connections. Public schools that operate educational programs available only through students' own computers are not truly accessible. - North American Council for Online Learning

Connecticut library staffs consistently report after-school hours are the busiest times for library services, especially for computer and Internet use. Their libraries are overwhelmed with student demands for computer access after school.

Libraries also play an important role for life long learning, closing the digital divide by providing one-on-one and formal information literacy and technology training. From helping patrons open their first email accounts to teaching Internet search skills and computer applications, almost three-quarters of all public libraries offer information technology training.

The number of people pursuing formal education outside a traditional classroom has grown significantly in the past decade. Outside of the traditional public or private school setting, parents of homeschooled students turn to public libraries to support their children's education. The percentage of public libraries reporting that providing education resources and databases for homeschooling is critical to the role of the library more than doubled between 2006 and 2007.

The growing number of people learning online have an impact on public libraries. Nationally, three-quarters of public school districts are offering online or blended courses, and the overall number of

K-12 students engaged in online courses in 2007-2008 is estimated to be just over 1 million. Many postsecondary institutions also offer distance learning for classes as an alternative to traveling to in person classes. These students depend on the resources at the public library.

Broadband is not only about speed. Rather it is an enabling tool that powers applications and can change people's lives. - Alliance for Public Technology

Public libraries help level the playing field for millions of America's children and adults, who rely on their libraries for learning resources over a lifetime. They are one of the few places where young and old, homeschooled children and adult learners can expand formal education and explore new interests. Public library staff ensure free access to computers and the Internet, select and provide trustworthy print and online research resources, and teach the searching and technology skills necessary to compete in the Digital Age. As technology evolves and new applications help link learners and educators across great geographical distances, public libraries serve as both an access point and a learning place. In a world in which knowledge is power, public libraries help make everyone more powerful. Investing in public libraries and high-quality technology resources is an investment in lifelong learning for all community residents.

Career and Business Development at Connecticut's Public Libraries

Connecticut librarians report that job seekers are flooding public libraries using public access computers and the Internet to find and apply for jobs; develop resumes; retool for careers; grow small businesses; seek to save failing mortgages, and more.

In the first decade of the 21st Century, classified job ads have gone the way of the mimeograph— nearly obsolete. Nearly three-quarters of job seekers now use the Internet to seek employment in part because this is the only way to apply for many job opportunities. Less than 44% of the top 100 U.S. retailers accept in-store paper applications anymore. With jobless rates up, the need for access to computers and the Internet is more critical than ever. One essential community institution is positioned to meet this growing need – the local public library.

Many families do not have high speed access at home, or have recently given up the expense of this access just when they need it to search for a job. They come to the public library to search for employment, prepare resumes, apply for jobs online and file for unemployment benefits. Aiding job seekers is increasingly viewed as a critical role for public libraries, with 60.2% of libraries reporting this service is critical to the library's mission (Libraries Connect Communities).

Many of those seeking assistance are first-time computer users. At the library, they learn how to use a mouse, how to open an email account and how to do an online job search. In addition to formal classes, many library staff report they are scheduling one-hour sessions with patrons to orient them to the broad range of skills to do research, find jobs, or apply for government assistance. Many librarians report that applying for jobs and government assistance are among the most staff-intensive patron Internet needs that also demands longer computer access time.

Web access at public libraries is about much more than research and exploring the digital world. Increasingly, Internet access is necessary for preparing oneself for new expectations of employers

and the web-based job application process. This increased activity has repercussions and costs. Despite ongoing improvement in the number of Internet computers a recent study indicated 68% of Connecticut public libraries report they do not have enough computers to meet demand. Most limit the time patrons can use computers in order to accommodate the most number of patrons possible. The most common reasons libraries are unable to expand computer access are space (75%) and cost (71%) (Libraries Connect Communities). To accommodate increased demand, many libraries offer wireless service to allow patrons to bring in their own laptops. Libraries have been witnessing a relatively new phenomenon with patrons operating their own small business or consulting firm out of their local library.

Rural economic development includes critical community institutions and resources necessary for economic competitiveness, such as libraries. Small business owners and other entrepreneurs look to their local libraries for information including the use of online databases. Enhancing broadband to libraries will provide more efficient and powerful access to essential resources for these small communities and small business.

Libraries are part of the solution when a community is struggling economically. From free access to books and online resources to library business centers that help support entrepreneurship and retraining, libraries support lifelong learning. Public libraries play a central role in local economic development efforts by providing physical meeting and training space, information professionals, and free access to computers, office software, specialized databases and the Internet.

Connecticut's Public Libraries as Access Points to E-Government

Increasingly libraries play a vital role assisting their patrons in accessing local, state and federal governmental information and services available exclusively online. Patrons may apply for unemployment benefits, apply for licensure, renew car registration, do business with the state, access government publications and information, submit their taxes, contact the Immigration and Naturalization Service, even apply for Medicare Part D. Often they rely on the public library to access these services and to find the information they need.

Congress defines E-government as:

the use by the Government of web-based Internet applications and other information technologies, combined with processes that implement these technologies, to enhance the access to and delivery of Government information and services to the public, other agencies, and other Government entities; or bring about improvements in Government operations that may include effectiveness, efficiency, service quality, or transformation (PL 107-347).

E-government has the potential to reduce burdens placed on government agencies, provide greater transparency, and help the public gain greater accessibility to all levels of government, but all this depends on citizen access to the Internet. Libraries have been at the forefront of the citizens' ability to access these e-government services especially when people don't have the skills or the technology at home.

Libraries also play a significant role in times of emergencies. The experience of libraries in the Southeast tell us that in the aftermath of a hurricane, communities rely on the public library Internet access to request aid, try to find missing family and friends, file Federal Emergency Management

Agency (FEMA) insurance claims and other forms, and begin rebuilding their lives (E-Government and Public Libraries: Current Status, Meeting Report, Findings, and Next Steps.   Information Use Management and Policy Institute, College of Information, Florida State University).

Connecticut Department of Information Technology POP2 Installation
Points of Int.

No. of Counties	1
Hsehld.	1,293,079
Poten. Jobs Created	3
Total Cost	$313,896

The purpose of this aspect is to reduce potential risk to public safety, health and economic impacts caused by a network outage. A second location (point-of presence) for all of the State's identified critical data circuits will be created to provide network resiliency in the event of failure in the private carrier networks or catastrophic loss of the State's Data Center at the Department of Information Technology in East Hartford, CT.

DOIT provides network access and IT services that facilitate all of the State's government operations. These services include infrastructure and applications that support mission critical business functions for the State of Connecticut Executive Branch Government Agencies as well as the Judicial and Legislative branches of the State government. Examples of critical agencies that will directly benefit from this project include the Department of Emergency Management & Homeland Security, Department of Public Safety, Department of Motor Vehicles, Department of Public Health, Department of Revenue Services and the Department of Social Services, among others. The State network and Data Center provide access and support for an overwhelming majority of the State's computer systems and applications. These services and applications include Internet access (both inbound to the State's hosted websites and outbound for external connectivity), Statewide Email, access to the FBI's NCIC system and numerous Ecommerce applications.